

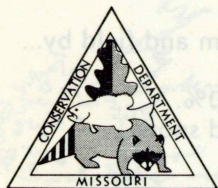
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WINDBREAKS FOR MISSOURIANS



TREE WINDBREAKS ADD TO THE COMFORT AND BEAUTY OF ANY FARMSTEAD!

Windbreaks offer landowners benefits in the home, farm and field by...

1. Reducing windchill and home heating bills by 20-30%.
2. Protecting people and animals from high winds and snow.
3. Reducing noise, dust and pollution.
4. Conserving field crop soil and moisture.
5. Attracting insect eating birds and upland wildlife.
6. Lowering livestock feed costs through better protection.
7. Reducing summer heat stress in livestock.
8. Reducing pond dam and shoreline erosion.
9. Protecting fruit trees and orchards.

Effectiveness

Windbreaks significantly reduce wind velocities on the downwind side for distances of 10 to 20 times the heights of the trees, depending upon the tree species and density...

Hardwood or deciduous trees, which shed their leaves in the fall, are not as effective as evergreen species for winter protection...however, even the bare limbs reduce wind velocities. Some of the advantages of hardwood species are that they are hardier, make faster growth and are taller at maturity than the evergreens. For this reason most authorities recommend the use of both evergreens and hardwood trees in farmstead windbreaks, provided each can be given adequate growing space.

Plan Windbreaks Before Planting

Start preparation for the windbreak in the fall. Plant the windbreak in the spring.

Locate the windbreak to effectively protect the homestead from the wind.

Consider available space. Some new fencing may be necessary to gain proper space for correct windbreak design.

Refer to chart when choosing trees and shrubs for the windbreak. These species have been selected for windbreak effectiveness as well as production of bloom, fragrance and berries.



ROW 1

Autumn olive
Black haw
Deciduous holly
Flowering quince
Forsythia
Highbush cranberry
Lilac
Mock orange
Redbud
Pyracantha
Privet
Nanking cherry
Tatarian honeysuckle

ROW 2

Black alder
Hawthorn
Jack pine
Persimmon
Red cedar
Scotch pine
Serviceberry
Norway spruce

ROW 3

Pin oak
Northern red oak
Shingle oak
Soft maple
White pine
Green ash
Loblolly pine
Shortleaf pine
Yellow poplar

ROW 4

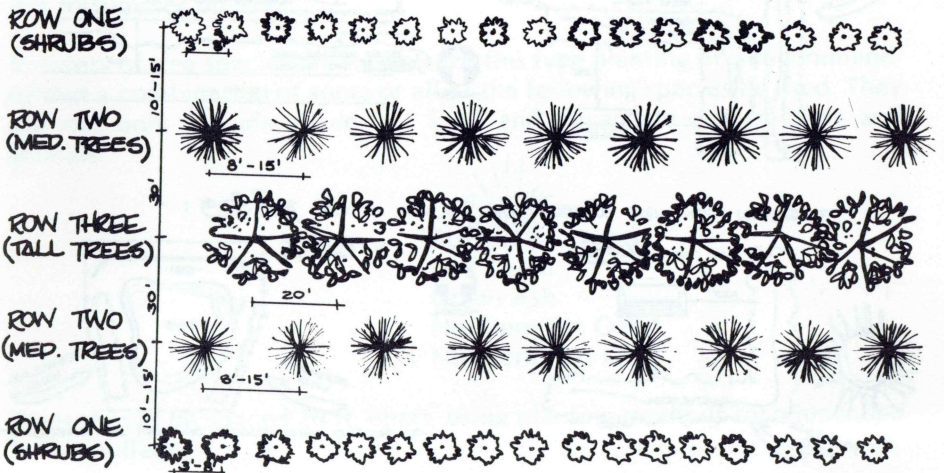
Black alder
Hawthorn
Jack pine
Persimmon
Red cedar
Scotch pine
Serviceberry
Norway spruce

ROW 5

Autumn olive
Black haw
Deciduous holly
Flowering quince
Forsythia
Highbush cranberry
Lilac
Mock orange
Redbud
Pyracantha
Privet
Nanking cherry
Tatarian honeysuckle

PLANTING PLAN

The diagram below shows the planting arrangement of a hardwood and evergreen windbreak. The staggered row arrangement gives best coverage...



If not enough space is available for the full five rows, an acceptable wind-break can be obtained by planting rows one through three.

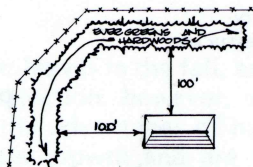
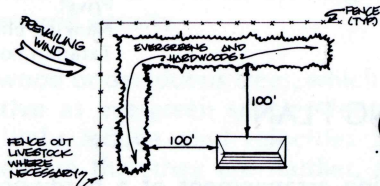
SHAPES AND PLACEMENT OF WINDBREAKS FOR VARIOUS NEEDS AND LOCATIONS ...

Design

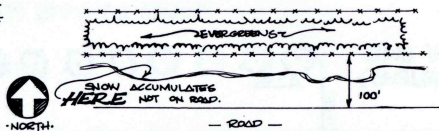
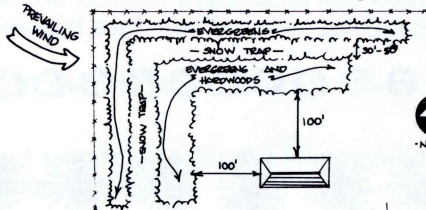
In planning the shape of your windbreak, consideration should be given to wind direction, roads, lanes, topography, buildings, fences, available space and other trees present.

The inside row of the windbreak should be no less than 100 feet from the buildings you are protecting. Plantings closer to the buildings invite hazards of drifted snow, fire and less summer comfort.

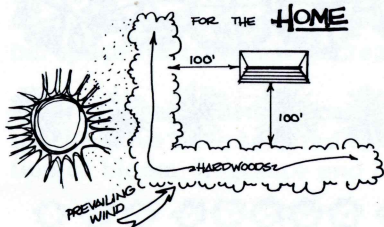
If the land slopes steeply to the North and West, it will be necessary to plant the trees closer to the buildings — but never closer than 60 feet.



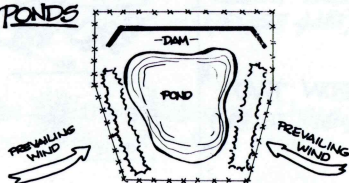
WHERE SNOW ACCUMULATION IS A **PROBLEM**:



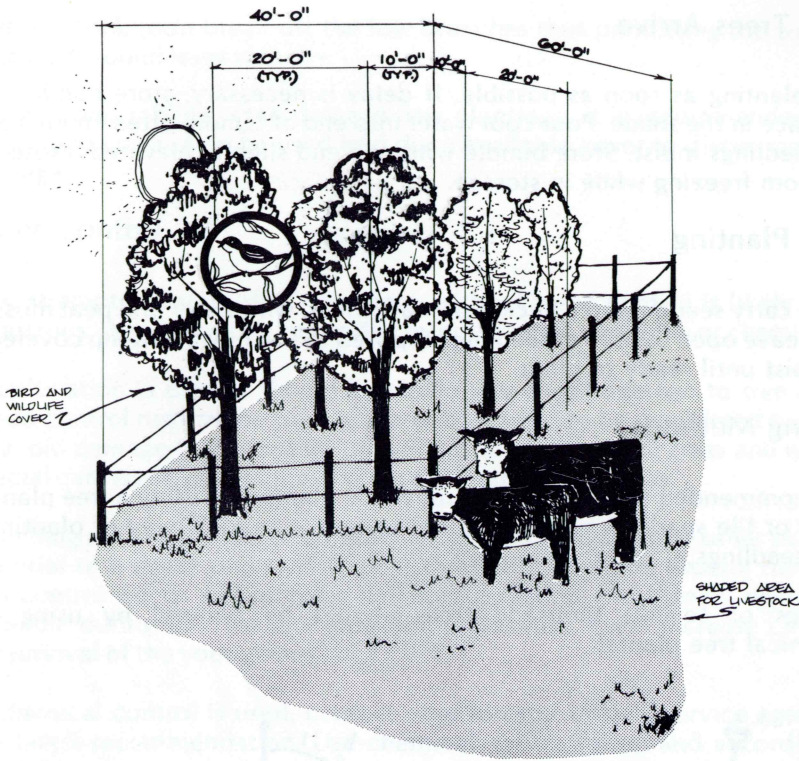
PROTECTION FROM HOT SUMMER **SUN** AND DRYING **WINDS**:



FOR **PONDS**



— TO PREVENT WIND EROSION ON DAM AND SHORELINE —



Pasture Shade Tree Planting

Planting will help reduce summer heat stress for livestock...wildlife such as small game and birds will also be attracted to these plantings.

Recommend fenced area of 40 ft. X 60 ft. located in pasture site that is subject to summer breezes.

A variety of tree species are suitable for this type planting. It is recommended that a combination of some or all of the following species be used. They will not only provide shade but food and cover for various birds and animals.

- Osage Orange
- Russian Mulberry
- Red Cedar
- Green Ash
- Northern Pin Oak
- Northern Red Oak

Trees should be spaced 20 ft. apart, using planting methods recommended in this bulletin.

When Trees Arrive

Begin planting as soon as possible. If delay is necessary, store bundle in cool place in the shade. Pour cool water into end of bundle often enough to keep seedlings moist. Store bundle with one end slightly elevated. Protect trees from freezing while in storage.

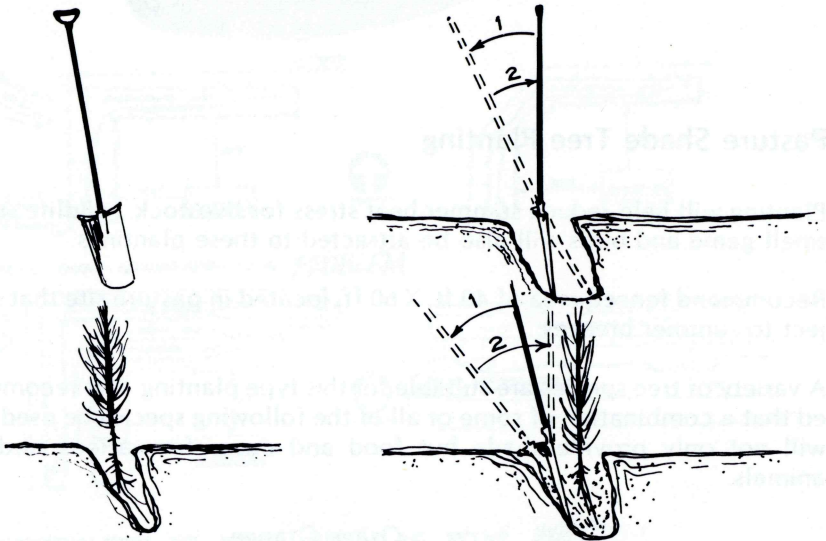
When Planting

Always carry seedlings in a bucket partially filled with water and peat moss. Never leave open bundle of seedlings exposed to sun or wind. Keep covered and moist until ready to plant.

Planting Methods

It is recommended trees in small numbers be planted by using a tree planting bar or tile spade. A power post hole auger is an ideal way of planting larger seedlings.

Plantings of several thousand trees should be planted by using a mechanical tree planter.



Protection

Windbreaks must be permanently fenced to protect the plantings from livestock and poultry. When livestock is permitted to walk into windbreaks the survival and growth of the trees will never be satisfactory...windbreaks will soon deteriorate and lose effectiveness. Wind travels at ground level

and livestock soon break off the low branches thus permitting the wind to regain its ground level velocity.

Rodents and rabbits often damage new plantings...it is recommended that mowing or cultivation be used to reduce available cover to discourage this damage.

Weed Control

Any attempt to establish a windbreak without weed control is likely to be disastrous. Weeds may be controlled by cultivation, mulching or chemicals.

If cultivation is used it should be shallow to avoid damage to tree roots. Weed control next to the trees will probably need to be completed by hand to avoid damage to the trees. If mowing is used to control grass and weeds, special care is required to prevent damaging the young trees.

Mulching with hay, well-rotted sawdust, ground corn cobs, or other suitable material to a depth of six inches in a three foot diameter around the trees will control weeds and increase moisture retention. Mulching is especially valuable during the first year of planting because it will increase chances for survival of the young trees.

If chemical control is used, contact your forester or field service agent for the latest recommendation. Use chemicals with caution and according to label directions.

Staking

Immediately after planting, trees need to be staked to hold them stable during the first year, to afford protection from lawnmowers, and to mark locations if weed control is delayed. Larger hardwood trees will need to be fastened to the stakes with wire or string ties.

Fertilization

Do not fertilize trees when they are planted. Delay fertilization for a year or two to avoid stimulating grass and weed competition. Heavy applications of nitrogen increase weed problems and attract rodents. Light application of low nitrogen fertilizer will stimulate tree growth.

Watering

If watering can be done, it will increase survival during drought periods. Once started, watering should be continued through the first growing season on a weekly basis.



Where to Order Trees

Applications for trees and shrubs for planting in the spring are available the preceding December. They may be obtained by contacting your local forestry office or the local University Extension Office. Application forms may also be obtained by writing to:

State Forester
Missouri Department of Conservation
P.O. Box 180
Jefferson City, Missouri 65102

Trees of larger than seedling size may be ordered from commercial nurseries. These will increase the cost but also reduce the number of years required to obtain an effective windbreak.